

# Carbon Finance for Off-Grid Lighting: Two Ripe Market Segments



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# Somewhat Improved CDM Method is Out

<http://light.lbl.gov>

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## THE LUMINA PROJECT

<http://light.lbl.gov>

### Technical Report #5

## From Carbon to Light

*A New Framework for Estimating Greenhouse-Gas Reductions  
from Replacing Fuel-based Lighting with LED Systems*

Prepared for the United Nations Framework Convention on Climate Change (UNFCCC)  
Small Scale Working Group  
Clean Development Mechanism (CDM) Executive Board

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*The Lumina Project* includes an Off-Grid Lighting Technology Assessment activity to provide manufacturers, re-sellers, program managers, and policymakers with information to help ensure the delivery of products that maximize consumer acceptance and the market success of off-grid lighting solutions for the developing world. Periodic *Research Notes* present new results in a timely fashion between the issuance of more formal and lengthy *Technical Reports*. Our results should not be construed as product endorsements by the authors or sponsors. For a full archive of publications, see:  
<http://light.lbl.gov/technology-assessment.html>

# Ideal Projects

- Large energy-intensity
- Relatively low cost of access to user
- Non-energy drivers to adoption
- Purchasing power
- Low programmatic risk
  - Additionality
  - Leakage
  - Reversion
  - Ease of monitoring & verification

# Night Fishing

- Energy use and emissions
  - \$70M/year on Lake Victoria, Lake Malawi, TZ coast
  - 85,000 Tonnes CO<sub>2</sub>/y
- Tim Gengnagel
- Philipp Wollburg



# Fuel-based practices

- Pressurized lanterns
- 8-10 hours/day
- 1-8 lanterns/boat
- Each lantern 1- 3 liters/night (avg 1.25)
  - 0.8TCO<sub>2</sub>/lantern-year
  - About 10x traditional wick lamp per lantern
  - One boat could emit ~100x more than a typical house





# LED alternatives

- Comparable yields
- Potentially easier to use
- Substantial demand
- Payback in months



- Hurricane lamps
- Long hours
- 30 lanterns per 1000 m<sup>2</sup>
- Business-like context





- LEDs
  - Owner-installed
  - Excellent performance
  - Identical yields; fast payback
  - Better working environment & happier chickens





- Excellent outcomes
  - Same yields
  - High reliability
  - More profitable op's

- Emissions reduction
  - 8 T CO<sub>2</sub>/y per 1000 m<sup>2</sup>
  - This is worth 100 household lamps





# Issues

- Additionality – negligible uptake at present
- Leakage – Program areas need to be properly defined
- Verification – relatively easy
- Reversion – key risk is quality problems....



# Continue the Discussion on LuminaNET.org

The screenshot displays the LuminaNET.org website, a social network for the global off-grid lighting community. The header features the site's name in large, glowing blue letters, with the tagline "A social network for the global off-grid lighting community" below it. A navigation bar includes links for HOME, MEMBERS, FORUM, GROUPS, BLOG, PHOTOS & VIDEOS, FIELD PROJECTS, MARKETPLACE, EVENTS, and ABOUT. The main content area is divided into several sections:

- 85+ MEMBERS:** A grid of member avatars with a "View All" link.
- WELCOME:** A section with a glowing light bulb icon and text describing the community's mission to create alternatives to fuel-based off-grid lighting. It includes links for Member Guidelines, Feedback, and Limit commercialism to Marketplace.
- FEATURED FORUM DISCUSSIONS:** A list of recent discussions, including "Heard at Lighting Africa meeting in Dakar..." and "Cheers to LuminaNET!".
- FEATURED BLOGS:** A list of featured blog posts, such as "An Introduction to The Light Foundation" and "Make the most of the 2012 Off-grid Lighting Conference in Dakar".
- GROUPS:** A section for various groups, including "Research Results", "Battery Charging", "Market Research", and "LEDs".
- MEMBER MAP:** A world map showing the locations of members, with pins concentrated in Africa, Asia, and South America.
- EVAN MILLS:** A sidebar section for a specific user, showing their profile, sign-out button, and a list of friends.
- PHOTOS:** A section for user-uploaded photos, with a "View All" link.
- LATEST ACTIVITY:** A section showing recent user activity, such as "Eden Full, Robert Hosbach, Jona Raphael and 3 more joined LuminaNET" and "Robert Hosbach just added their location".

The website is decorated with images of people using off-grid lighting solutions, such as solar-powered lamps and mobile phones.